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THE MAC FLYER - For Greater Safety in MAC Air Operations

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Cover by Tommy O'Laughlin of the new C-29.

See *your* story in this space.

Everyone has a story to tell—so why not put it on paper for the MAC Safety Writing Contest?

As former line-swine ourselves, we know you have a lot of "war" stories normally reserved for unit meetings or your favorite watering hole. Why not put that great story you've been telling about that "close call" in writing? Of course, you may want to tone it down some just to make it more believable, but after that, type it up according to the fine print rules below, get it into the mail, and kick back to relax as your literary masterpiece is selected as a winner. As such, you'll become the proud owner of a beautiful desk set or plaque. Everyone receives a one-year subscription to the world's greatest flight safety publication—*The MAC Flyer.* Come on—dazzle us with your brilliance. There are lots of untold stories out there!

THE RULES

The 1990 MAC Flight Safety Writing Contest is conducted according to MACR 900-3 and these rules. Entries must be original, unpublished, contain an aviation safety/mishap prevention message, and be postmarked no later than 31 March 1990. Stories must be between approximately 1,000 and 3,000 words long (about 6 to 14 double-spaced typed pages). Poetry should average 75 to 100 lines. Manuscripts must be typed, double-spaced, and submitted in two copies. Identify entries by title only and attach a cover sheet indicating author's name, address, duty phone, unit and home address. Please include a brief biography.

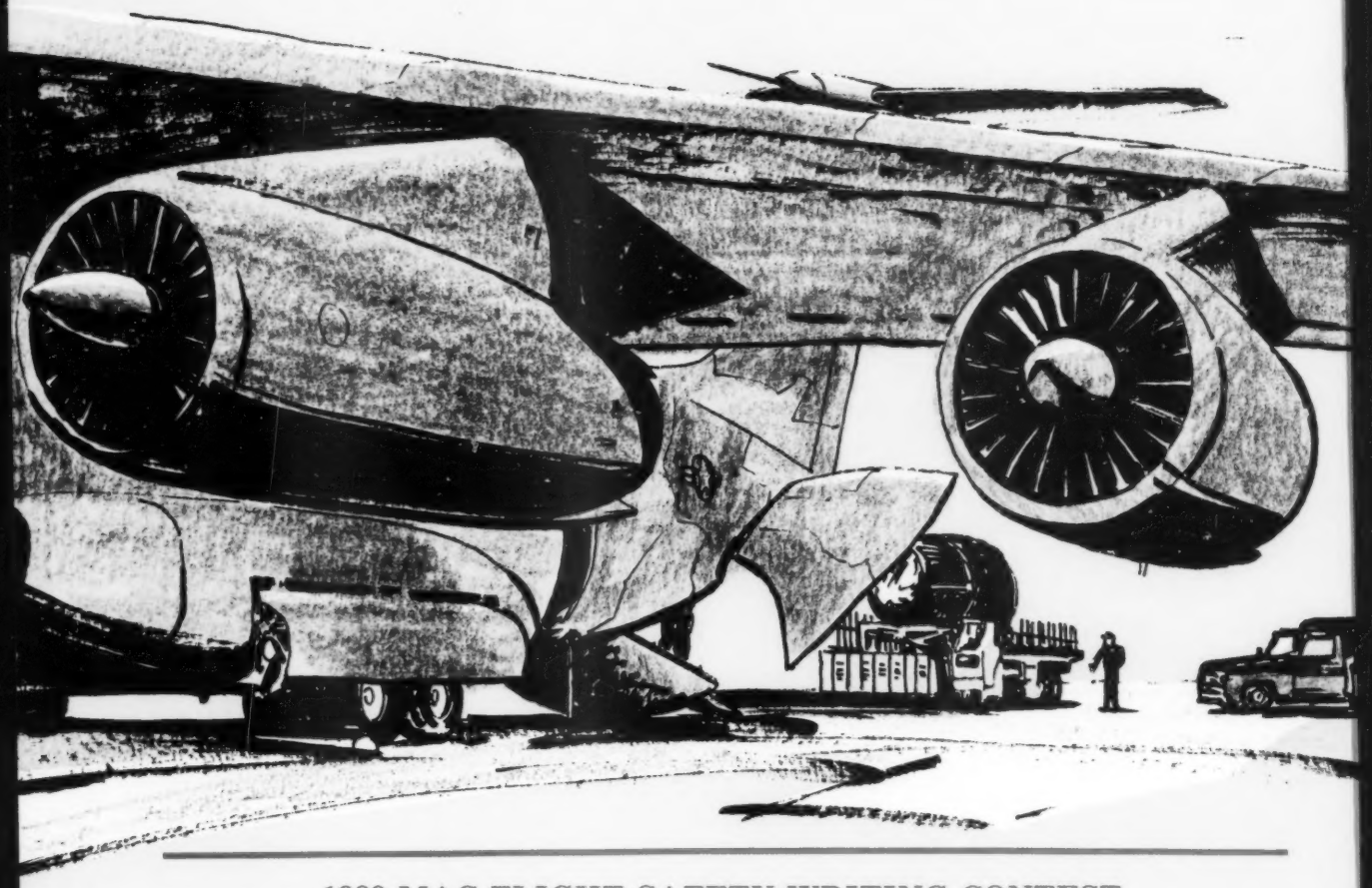
The contest is open to all. Entries qualifying under the above rules earn their author a complimentary one-year subscription to *TMF.* However, desk sets and plaques may be awarded only to military members and civilian employees of the Department of the Air Force and Air Reserve Components. Other entries may be selected for Honorable Mention, Special Category.

Winning entries will be published in *TMF.* Submit to:

MAC Flight Safety Writing Contest, 1990
HQ MAC/IGFE
Scott AFB, Illinois 62225-5101

Countdown to Catastrophe

Safety takes a back seat to "get-home-itis."



1989 MAC FLIGHT SAFETY WRITING CONTEST
HONORABLE MENTION

By MSgt. Curtis L. Connor
443 TCHTS/TTDL

Crew rest rules—they apply to loadmasters, also. The very safeguards intended to work in your favor can sometimes hinder mission effectiveness or even jeopardize mission safety.

The emphasis placed on crew duty regulations was made clear to me when I busted a checkride for violating predeparture crew rest. I'd done a little office work a few hours prior to alert time for a mission. The evaluator rated me Q-3 when he found out about it during crew briefing. Thereafter, I maintained a cautious respect for prescribed rules and followed them to the letter.

The rules, however, don't always protect you from fatigue. Common sense and good judgement remain the only safety valves when physical endurance threatens safe operation around the aircraft.

The following story describes a "routine" mission which turned sour because of fatigue. I was unsafe, although ironically, I was legally crew rested for this particular mission. I tell this story hoping it might prevent others from succumbing to the same trap. Here's what happened:

Originating Base

0545: Contacted Command Post for alert status update. Time had slipped to 0645; they said "Go back to bed and get some more rest."

0715: Showed at squadron and was told aircraft was already loaded. However, the aircraft had aileron trim and nose wheel steering problems.

0730: Informed the scheduled aircraft would be unable to fly; we needed to download two C-5 engines and load the backup aircraft. The other loadmaster went to the original aircraft with the load crew and started downloading. I went to the new aircraft and started preflighting. As expected, the aircraft was not ready—it was rigged for heavy equipment airdrop. The anchor cables had to be taken down and rollers turned over. I found the crew chief and asked him to contact the 780 section to take down the cables and help reconfigure the aircraft. He stated "this aircraft is the backup for the airdrop mission flying today." After a debate and a call to maintenance control, he agreed to help.

0815: As I visually lined the engine up with the ramps, the crew chief worked on the cables. Two rail fittings refused to leave their nests (the small things started to annoy me). Spying the crew chief's tool box, I grabbed a pair of vise grips and proceeded to extract the stubborn fittings. I tried to fit the rail into the storage area on the right side of the aircraft. Having much difficulty and realizing it was a two-person operation, I yelled for help. The crew chief and scanner assisted in putting the rails in their proper place.

0830: By now, the maintenance stand was out of the way and the winch had been reeled out. Next, came the part of getting a C-5 engine with cradle into the belly of a Starlifter. Ramps in place, chain bridle connected, winching crew briefed, brakes off on the cradle, and winching checklist completed—we were ready. The engine went on with hardly a hitch and we set up to winch the remaining engine. I glanced at my watch and thought, "If the second one goes on as easily as the first, we still may be able to make an on-time takeoff." We uploaded and tied everything down in only 40 minutes, then blocked out as I doublechecked the water jug, chocks, and loose equipment. Bad luck—we have to wait for takeoff because the three-ship airdrop mission beat us to the end of the runway.

1014: Our Starlifter, with 39,000 lbs of engines in its cargo compartment, lifted off the ground 14 minutes late. Still a great job by the crew.

Stop One

1330: Uneventful landing. Only took six minutes to ERO the deadhead crew. Doors closed and off to Stop Two.

Stop Two

1540: Another uneventful landing but, for some reason, I always hold my breath when carrying rolling stock until the spoilers retract and the pressure is off the chains.

1630: About 50 minutes after landing, the loading crew showed up. After offloading our two engines, we would upload two others to take back to home base. Offload necessitated jacking the cradles so they would not drag when going over the ramp crest.

1650: Someone yelled "Stop" as the first engine was going down the ramp. The tension on the cable became very tight (engine sitting on the ramp). I felt the aircraft roll back and instantly thought, "parking brake!" I ran up to the flight deck and mentally reviewed my checklist items again. I felt sure I'd checked the parking brake. Maintenance had *released the brakes* when they'd checked the tires! After resetting the brakes, I returned to the winching operation and continued to offload our cargo.

1745: After we offloaded both engines, maintenance began a tire

change. I hoped they would hurry because I didn't want to be loading in the dark. Forty-five minutes later, the tire was replaced and we were ready. That ramp looked mighty high at the crest because of low fuel and lack of cargo.

1930: We pulled the first C-5 engine up to the ramp. Manually aligning the cradle with the ramp, it took us 45 minutes to load the first engine.

2015: After shoring the ramp (a procedure not found in the Dash 9) the second engine went on a little easier.

2050: Later, on walkaround inspection, loading damage to the first engine was discovered. The C-5 engine shop looked at the damage to the engine cowling and determined it could not be used until repaired.

2100: I talked with the pilot and NCOIC about the probability of running out of crew duty day by the time we got back home. I asked the pilot to consider entering crew rest so we could make a fresh start.

2130: The aircraft commander called home command post to advise them of our situation. One half hour later, he told us he'd taken a crew duty extension. A 1-hour extension was fine for the rest of the crew, but I dreaded this last leg (with passengers) to be followed by a 2-hour download.

Home Base

0015: Once we landed back home, the rest of the crew departed, their role complete.

0045: We (loadmasters) started popping chains from the cargo and putting the loading hardware away in proper storage areas. I quickly ran through my checklist, hurrying so I could start the drive home to get some sleep and make an 0800 meeting in the morning.

0100: Suddenly, with obvious excitement in his voice, the crew chief came running to the back of the aircraft to tell us that *"the loading struts are not down!"* Immediately, the operation was stopped. Struts were put down—just in the nick of time. All of us were shaken by the thought of "what could have happened." We also dreaded what would happen when everyone got a look at the damage we had done to the C-5 engine.

0200: Finally, both engines were off, the aircraft cleaned, and struts stored. I was so tired I didn't go inside to fill out my currency sheet. I just wanted to lay down and forget the events of the day. However, I just couldn't avoid thinking about the catastrophe we'd been inviting throughout the mission. The warnings were there, but they'd just been ignored. From my "loadmaster perspective," we should have called it quits back at the second stop when it became clear we'd bust the crew duty day, and our fatigue was causing us to make a succession of little procedural errors. "Get-home-itis" became the controlling factor driving the mission, and safety took a back seat.

My message is really a commonsense plea to other loadmasters, aircraft commanders, and mission controllers. The team is only as strong as its weakest link, especially when fatigue sets in. The load crew is often regarded as the most flexible component of that team, and we adapt whenever we can. We're as dedicated to getting the job done as anyone else, but need to be considered when the strain of a long mission threatens to compromise safety. On-time departures and safe landings are not the total picture. Delivering the goods in serviceable condition is *really* the big picture. Damage to cargo or the back end of an airplane can *RUIN EVERYONE'S DAY.*

MSgt. Curtis L. Connor entered the Air Force in January, 1971. Following assignments to Andersen AFB, and Peterson Fld, Sergeant Connor returned to Lackland AFB as a Military Training Instructor. After cross-training into the Loadmaster career field Sergeant Connor served three years at McGuire AFB before moving to his present assignment as C-141 Loadmaster Course Developer at Altus AFB.

Flying-Hour Milestones

10,000

41 MAS
Lt. Col. Thomas V. DiGangi, Jr.

145 TAG
SMSgt. James P. Young

185 TAS
Lt. Col. Jean P. Blackard

328 TAS
SMSgt. Eric F. Renaud

7,500

6 MAS
SMSgt. Peter A. Jensen, Jr.

17 MAS
SMSgt. Claude A. Irelan, III.

41 MAS
Lt. Col. Douglas S. White

76 MAS
MSgt. Raleigh S. Bramlette

145 TAG
SMSgt. Kenneth H. Roberts

5,000

6 MAS
Col. Ernest H. Jones, Jr.
Maj. Frank L. Machesky
MSgt. John C. Monahan
MSgt. Mark A. Moran
TSgt. John W. Gordon
TSgt. Eugene R. Meany
TSgt. Peter C. Moritzen
SSgt. Ricky D. Fisher
SSgt. Steven Goldberg
SSgt. Philip N. Julia

17 MAS
TSgt. Kenneth D. Tiley

18 MAS
Lt. Col. Daniel P. Quinn, Jr.
Lt. Col. George D. Schafer
Maj. John E. Tamkun
CMSgt. Bruce E. Brunkow
MSgt. Kevin S. Davis
MSgt. Duane Edwards
MSgt. Harry B. Wallis
TSgt. Richard K. Bauman
SSgt. Barry A. Lennon
SSgt. Randall A. Morris
SSgt. Dennis G. Nerolich
SSgt. Matthew J. O'Hara
SSgt. Michael J. Zavisho

21 AF/DOV
Lt. Col. Stephen J. Gaertner

30 MAS
MSgt. Keith A. Lisby
TSgt. Christopher J. Wigfall, Jr.
SSgt. Frederick W. Martin

76 MAS
MSgt. Roy S. Robertson
TSgt. Horace S. Busbee
TSgt. Francis J. Lovell

145 TAG
MSgt. James T. Rorie
MSgt. John A. McRae, III.

616 MAG
Maj. Herbert S. Trapp
TSgt. Christopher D. Jeffries

907 TAG
Lt. Col. James E. Hiestand

2,500

ARS
TSgt. Michael W. Lael

6 MAS
Maj. Alan M. Becker
Maj. Ned F. Cash
Maj. James P. Lacey
Maj. Geoffrey P. Mallett
Maj. Robert J. Smith
Maj. Norman F. Thompson, III.
Capt. Lawrence E. Barnard
Capt. Robert A. Coggins
Capt. Christopher Conwry
Capt. John P. Hubert
Capt. Kenneth F. Kealar
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Capt. Stephen T. Scott
Capt. Joseph O. Smith, II.
Capt. Jonathan W. Spare
Capt. William E. Stone, Jr.
Capt. Richard J. Walberg
Capt. Richard S. Wharton
Capt. John W. Yeash
Capt. Robert H. Zeigler
SMSgt. Edward P. Barnes
MSgt. Frank W. Maile
TSgt. William R. Boutchia, III.
TSgt. Timothy J. Gould
SSgt. Ronald J. Bennett, Jr.
SSgt. Brian M. Boardman
SSgt. Jeffrey L. Daniel
SSgt. James W. Day, Jr.
SSgt. Dale C. Gagnon
SSgt. Paul G. Hiller
SSgt. Bobby R. Hudson, Jr.
SSgt. Jeffrey M. Leonard
SSgt. Roger Lynch
SSgt. Alonzo J. Miller, Jr.
SSgt. Darryl D. Pearson
SSgt. Angel E. Rosado, Jr.
SSgt. Bruce W. Tibbetts
SSgt. Mark R. Bergman
Sgt. Ronny L. Morton
Sgt. Lonnie S. Ness
Sgt. Craig L. Terry

109 TAG
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Capt. James E. Blakney
Capt. Michael E. Burkley
Capt. Linda Dills
Capt. Daniel J. Dunbar
Capt. Bernard J. Duszkiewicz
Capt. George C. Meyer
Capt. Paul W. Neuhaus
Capt. Judson T. Skaife
MSgt. Mark S. Wielt

3 MAS
Maj. Gary L. Kirsteatter
Maj. James F. Wooddell
Capt. Wes C. Austin
Capt. Lloyd B. Mohney, III.
SMSgt. Lee R. Smith
TSgt. Richard H. Parker
SSgt. Robert L. Miinch

9 MAS
Capt. Scott A. Sweet
MSgt. Michael Dellaquila

18 MAS
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Maj. Gregory A. Lokken
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Maj. Sidney J. Prejean
Maj. Michael C. Strouse
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TSgt. Jerome C. Hanson
SSgt. Michael B. Decker
SSgt. Robert W. Fisher
SSgt. Terry L. Foley
SSgt. Robert W. Freda
SSgt. Michael J. Johnson
SSgt. Nathan D. Sheets
Sgt. Adam M. Paul

30 MAS
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Capt. Paul L. Andrews
Capt. Perry T. Eskau
Capt. Mark J. Guidi
Capt. Matteon S. Hammond
Capt. Timothy S. Jewett
Capt. John E. Johnson, Jr.
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Capt. Alexander Sidlowski
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Capt. James R. Wells
Capt. Dan R. Yeamans
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TSgt. Timothy P. Barr
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SSgt. Theodore L. Clever, Jr.
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SSgt. Richard D. Doerr
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SSgt. Russell L. Graham
SSgt. Daniel D. Green
SSgt. Stephen W. Harmon
SSgt. David S. Kiczales
SSgt. Lawrence W. Smith
Sgt. Ronald E. Harrison
Sgt. Stephen J. Horvat
Sgt. Glen A. Shaide
Sgt. Thomas Woolfolk, III.

36 AES
MSgt. John M. Martin
TSgt. Wendell L. Hall

137 TAW
TSgt. Lyndel K. Brinegar
TSgt. Paul T. Gill

312 MAS
Lt. Col. Leonard P. Bochicchio
Lt. Col. William F. Gallogly, Jr.
Lt. Col. Gary W. Webb
Lt. Col. John C. Wagnitz
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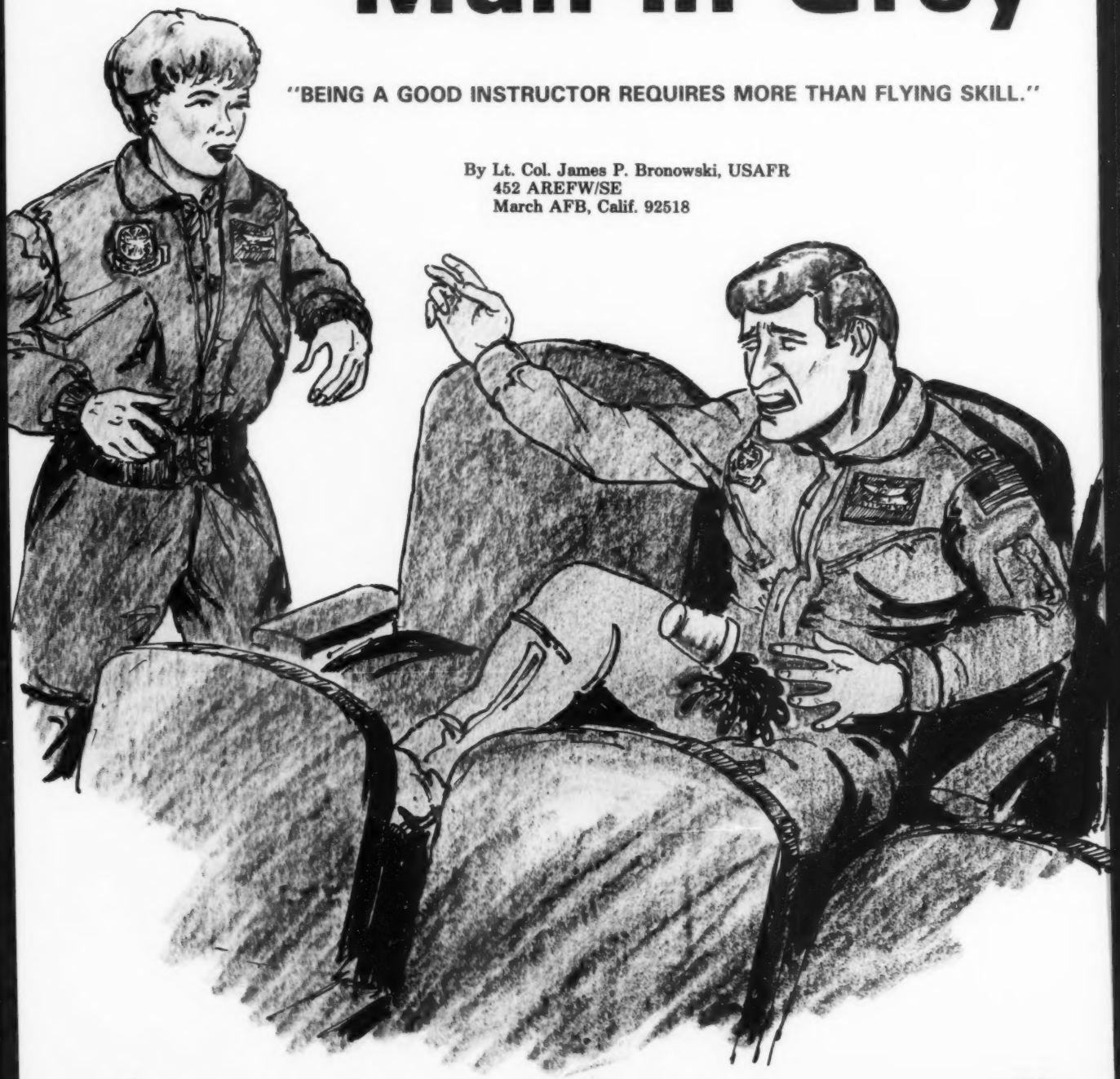
Sgt. Anthony J. Drake

Ranks and units are those at time of award.

The Man in Grey

"BEING A GOOD INSTRUCTOR REQUIRES MORE THAN FLYING SKILL."

By Lt. Col. James P. Bronowski, USAFR
452 AREFW/SE
March AFB, Calif. 92518



Charlie and his copilot Max were slumped in the two middle seats in the last row of the briefing room. It was their special spot and required a 10-minute early arrival to secure.

Today was the monthly flight safety meeting, and Charlie had earned the prestigious rear seat because of his seniority as an aircraft commander and selection for instructor status. It is the best seat in the house from which to fling barbs at other pilots. Like the gunslingers of old, having your back to the wall is the best way to keep your eye on everyone and is the easiest spot to defend because you don't have to turn around.

Max had inherited the spot of honor through association. To be on Charlie's crew was akin to making it to the major leagues. There was no doubt in anyone's mind that Charlie was an excellent pilot. There was no doubt in Max's mind that Charlie was the best pilot in the world. Max idolized Charlie and they were solid friends. Max mimicked everything Charlie did, and when they were separated, which was seldom, people would ask where his "brother" was.

Charlie's feet were propped up against the theatre seat in front of him forcing his knees to about eye level, an uncomfortable position, to say the least, but fitting for one wearing the crown. His hands rested clasped behind his head to protect his skull from the brown wallboard directly behind his seat. His elbows protruded out at a 45-degree angle and provided a target frame for his field of vision. From time to time it became necessary to pivot head and elbows to observe someone entering from the two rear doors.

Max was positioned as a mirror image of his boss. As crewmembers started slowly wandering in doing the "flight suit stroll," he accepted the comments his mentor made about each one with the total assurance that every critique was true and correct. He also knew this idyllic relationship between Charlie and himself would not last much longer because of Charlie's upgrade to instructor. In the meantime, it was proper and right to take advantage of one's established position in the hierarchy of the pilot's social ladder.

"Hey, Steve," Charlie called towards a tall, dark-haired captain moving into a seat about four rows in front of them. "Saw your landing yesterday. Hope nobody was hurt. Great carrier landing though. Rudder pedals are those funny looking things on the floor, you know."

The captain looked at Charlie with noticeable hurt in his eyes, took the cuts at his flying ability, glanced around at the others looking at him, and silently took his seat.

Charlie turned toward Max and said quietly, "My, isn't he the touchy one?"

Max wasn't sure he would care for the public ridicule Steve had endured either, but he wasn't about to mention anything to his boss.

Just then Charlie's feet hit the floor; he sat up straight and began tucking his scarf in. It took Max a matter of seconds to determine the reason for this unorthodox behavior from Mr. Cool himself. For there, standing with her hands in her flight jacket pockets was the prettiest pilot in the Air Force. At least Max thought so, and from his reaction so did Charlie.

"How are you doing Charlie? It's so nice to see you again," she said softly and then smiled at him.

While the smile still shined Max could see the flush come to Charlie's face. His cheeks turned sunburned red as he searched his memory bank for clever comebacks and witty sayings.

"Uh . . . just fine . . . Christy," was the best he could do. And to top it all off, as he brought his arm up to give her a casual wave, he knocked his cup of hot coffee off the armrest and its contents hit dead center on his lap.

As Charlie tried to act casual about the hot liquid now burning his flesh, Christy turned, walked a couple of rows down and moved in to sit next to her aircraft commander, Steve. After sitting down she shot another glance at Charlie who was very busy trying to recover from possible third degree burns.

Max watched Charlie swab at the giant wet spot on the front of his flight suit in a feeble attempt to cool off what was very hot and wet. Max knew he would soon lose his friend to the devastator of all cool guys: Love. He'd watched Charlie's mouth drop open in an uncontrolled response when she smiled and noted Charlie was at a loss when she spoke. Watching his buddy, the "Pilot's Pilot," "The Man," "Mr. Cool," "The Iceman," turn into a quivering mass of Jello, made Max a bit ill. After seeing the damage done from one smile, there wasn't any doubt in Max's mind who would be flying left seat in that relationship.

At five minutes past the scheduled start of the meeting, people were still wandering in, picking seats near people they liked or at least could associate with.

The flight safety officer was at the podium rearranging a stack of papers; two individuals were setting up the video tape machine and everyone was talking. Suddenly, the flight safety officer dropped his hands to his sides, stood erect and, in a relapse to his

"I PROPOSE TO YOU INSTRUCTORS THAT YOU DON'T REALIZE HOW IMPORTANT YOUR JOB IS!"

Academy days, barked out: "Squaad . . . roon, ten hut."

There was an immediate clatter as seats snapped back, a few unsecured objects fell, knees cracked, and a couple of sets of boot heels clicked together. Then silence, save the footsteps of a single individual coming down the aisle at a rapid pace. Silver eagles rested on the shoulders of the imposing figure making its way towards the podium. It was the wing commander.

When he reached the podium, he walked behind it and stood looking at the assembled crewmembers. People started to fidget waiting for the commander to sit, but it did not come. Instead, the colonel moved his eyes over every face in the room at a deliberatly slow pace as if he were trying to identify someone in a police lineup.

"What's going on?" whispered Max through his teeth.

"Dunno," was Charlie's quiet response.

The wing commander had moved to a spot right in front of the empty center row seats. He took a final scan of the 60 or so men and women at attention and commanded, "Please be seated."

There was the rustle of flight jackets and the thumping of spring-loaded theater seats as all eagerly obeyed the command. In the few seconds it took to get everyone settled in, the colonel took another look through the group. Finally curiosity again brought silence as all waited for him to speak.

"Late last night I received a phone call," he began. "My closest friend of 25 years was killed in an aircraft accident yesterday. The call was from his wife. I was best man at their wedding and attended both their daughters' . . . ." His voice trailed off.

He stopped for a few seconds, looked towards the ceiling and then drew in a deep breath.

"You people are my responsibility," he continued. "I am accountable for your safety. I will not allow any variations to established procedures nor will I tolerate any disregard for safety practices. I am your safety officer."

As he paused, there was dead quiet in the briefing room. Even the whir of the electric clock above Charlie's head could be heard throughout the room. There was no doubt in anybody's mind that this highly respected man meant business.

"I have given a great deal of thought, during most of the night in fact, to what I can do to ensure none of you are injured or killed in the line of duty," he said with some of the firmness leaving his voice. "I have asked a friend to speak to you this morning."

The commander took two steps forward, turned and sat in the middle seat of the front row. All heads, save his, pivoted to the rear of the room. There, standing just inside the door, arms folded across his chest, was a man dressed in a grey sweater and grey slacks. His head had not a hair on it and the top of it reflected the overhead lights like a polished table. The man stood over six feet tall and obviously kept himself in good shape because an accurate guess of his age would have been very difficult.

"Good morning ladies and gentlemen," he said with a strong voice that filled every corner of the room. He remained standing, arms still folded, as his bright blue eyes scanned the assembly. Everyone remained half turned in their

seats, not knowing what to expect.

The man dropped his arms to his sides and with giant strides walked down the slight incline to the front of the briefing room. As he swung around toward the group, a big smile highlighted his face. It was a natural smile, one he undoubtedly wore all the time.

"I will be very brief today," he began. "But what I have to say is most important.

"My name does not matter, nor would you remember it if I gave it," he continued. "Let it suffice that I flew combat in three wars and accumulated another 12,000 hours in peacetime. What I have gained through all that experience is caution and respect for every aircraft I fly and a profound appreciation for safety in all flight operations."

He lifted his right arm and made a sweeping movement across the group. "You are the strength and fighting resource of this country. You are the limited resource we cannot affort to lose or waste. You are the reason the flight safety program must be the commander's highest priority.

"Everyone is responsible for flight safety, and you all know that, but there is a group of you that are most directly involved and will ultimately be a factor in who lives and who dies."

As he paused, there was a noticeable nervousness among the crewmembers. They were looking around wondering who he was about to single out that could have such an influence in matters of life and death.

The smile left his face and was replaced with a serious look that immediately drew everyone's undivided attention.

"It is you instructors that I'm referring to," he said as he pointed his right index finger at a major sitting three rows from the front. "You are the key to flight safety. You determine the habit patterns and techniques of all flyers. The example you set and the minimum standards you maintain for yourself are what establishes the quality of the unit. In the end, the flying organization and its safety record will be no better than the quality and professionalism of its instructors."

He now stood with his feet apart and his hands resting on his hips. "You instructors were hand-selected because you are the best. You have demonstrated above average flying abilities and a capability to effectively work with others."

Max gave Charlie a quick sideways glance. He was indeed proud of his aircraft commander, but there would be no possible way to let him know that. He could see Charlie was intently hanging on every word the man was saying.

"I propose to you instructors that you don't realize how important your job is," he went on. "Not only must you teach correct procedures and accepted techniques, and monitor the flying proficiency of all crewmembers, you have an even more important and critical mission—you must find and identify weaknesses, both in people and procedures. If the weaknesses are not corrected, that individual should not be in a flying position, and it's your responsibility to ensure they are not!

"The flight instructor is the core of the Air Force. The effectiveness of our arm is totally dependent on the instruction our aircrews receive. The lives of our fellow fliers depend on your skill and dedication. There can be no more important or more honored profession than that."

The man in grey looked down at the wing commander and said something quietly to him. The commander then stood and shook the man's hand vigorously, put his right arm around the man's shoulder, and the two of them started toward the back of the briefing room talking quietly.

The room was strangely quiet as the words were still sinking in to the group. Suddenly, someone realized the situation and called the room to attention. It didn't matter as the pair had already departed through the rear door. Everyone was standing now from the call to attention but realizing the commander had departed, they all started talking and discussing the past few minutes.

Max turned to Charlie and said, "Man, that was awesome."

"It sure gives me a whole new concept of the instructor program," Charlie added.

Charlie noticed that Christy had moved into the aisle in front of them and was staring at him. Her lips were drawn tight and her eyes were stone cold, sending a message that was the complete opposite of her last eye contact with Charlie.

Max took a step sideways as he could see the impending conflict.

"Charlie," she began as his name slid from between clenched teeth, "Steve tells me you didn't like my landing yesterday. He said you broadcast it all over the room before I walked in. You certainly lack any class whatsoever."

The best Charlie could come up with was a very weak "Ah . . . .," which she didn't hear anyway because she spun around and stormed out the door.

A smile came to Max's face with the realization that his good friend's bachelorhood would remain intact for at least the foreseeable future.

"You know Max," Charlie said as he slowly sunk back into his seat. "I can see being a good instructor is going to require good hands AND diplomacy."

The First Two Minutes

Prevention is More Effective Than Reaction!

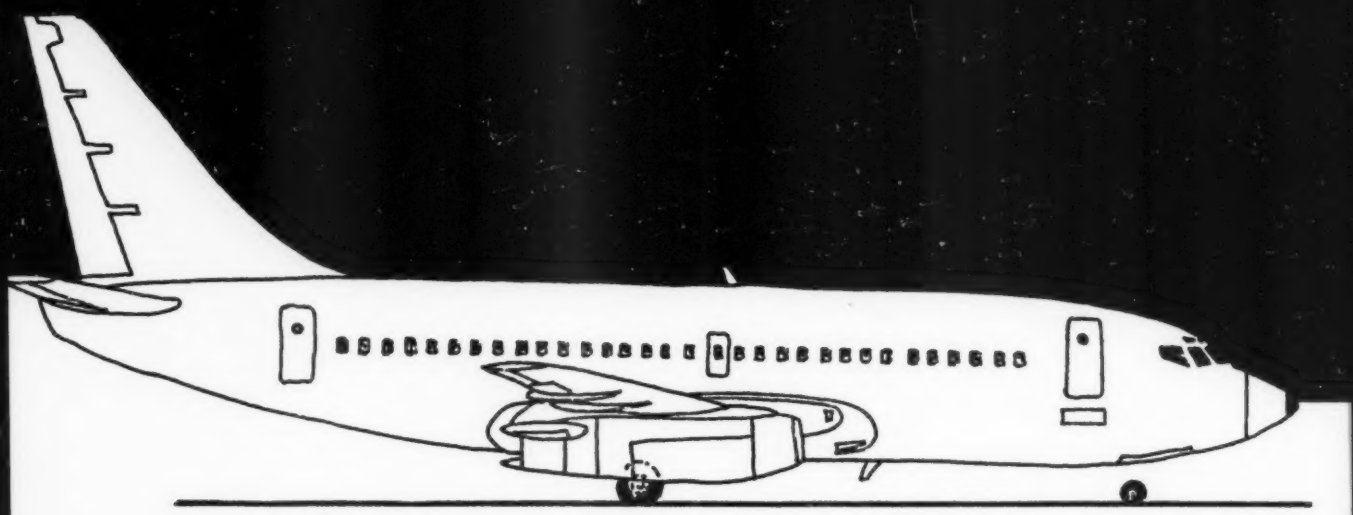
By Gerard M. Bruggink

Worldwide accident statistics consistently show that most air-carrier mishaps occur in the approach and landing (A&L) phase of flight. These same statistics show that takeoff (T/O) accidents are the next most frequent. However, when the U.S. statistics are broken down into five-year segments, a different pattern emerges. During the 1983-1987 five-year period, T/O accidents surpassed A&L mishaps in terms of both frequency of occurrence and occupant deaths: five vs three and 472 vs 138.

The reduction in A&L accidents began with the systematic identification of correctable problems followed by preventive initiatives. Based on the industry's success in lowering the accident risk in the A&L phase, it seems reasonable to assume that a similar approach could lower the frequency of takeoff accidents. With this goal in mind, here is a review of the 18 fatal takeoff accidents involving U.S. operators over the past 20 years. The total number of occupant deaths from the 18 accidents is 1,151.

WEATHER RELATED ACCIDENTS

Boeing 737, 13 January 1982, Washington, D.C. About 75 seconds after the start of the takeoff run from National Airport, the aircraft struck one of the Potomac bridges and crashed into the river. Of the 79 occupants, 74 were killed. Weather at the time of the accident was characterized by subfreezing tem-



peratures and moderate-to-heavy snowfall. The crew did not use engine anti-ice during ground operations or takeoff. As a result, both engine inlet pressure probes became blocked with ice before takeoff. This caused erroneously-high EPR readings which, in turn, resulted in a thrust deficiency of 3,750 pounds per engine. The crew set takeoff thrust by referencing erroneous EPR gauges. The lower-than-normal thrust setting was aggravated by snow or ice accumulation on the airframe. According to the accident report "either condition alone should not have prevented continued flight." It was also noted the crew "did not add thrust in time to prevent impact."

Boeing 727, 9 July 1982, New Orleans, La. The aircraft crashed into a residential area about 67 seconds after the start of takeoff roll when it encountered a decreasing head wind shear of about 38 knots associated with a microburst. None of the 145 occupants survived. The causal statement characterized the accident as an act of God by attributing the mishap to the violence of a microburst "the effects of which the pilot would have had difficulty recognizing and reacting in time . . ." The contributing factor was listed as the inability of current windshear detection technology "to provide definite guidance for controllers and pilots . . ."

DC-8, 12 December 1985, Gander, Newfoundland. This was a military contract flight from Europe to the U.S. During takeoff following a refueling stop at Gander, the aircraft settled into the trees just beyond the departure end of the runway. The 248 passengers and eight crewmembers were killed. Five of the nine Safety Board members attributed the aircraft's stall at low altitude to ice contamination of the leading edge and upper surface of the wings. Weather conditions were conducive to icing, and the aircraft was exposed to freezing and frozen precipitation while on the ground. The aircraft was not deiced. The majority also believed the effects of aircraft icing could have been aggravated by loss of thrust of the Number 4 engine and inappropriate takeoff reference speeds.

DC-9-10, 15 November 1987, Denver, Colo. The aircraft took off in a snowstorm about 27 minutes after being deiced. During that time, the aircraft accumulated an unknown amount of contamination on portions of its lifting surfaces. The First Officer, who was flying, rotated the aircraft at about twice the normal rate. Shortly after liftoff, the aircraft began to roll and the left wing struck the ground. The aircraft broke into three sections. Of the 82 occupants, 28 were killed. The accident was officially attributed to: "The Captain's failure to have the aircraft deiced a second time, after a delay before takeoff, that led to upperwing surface contamination and a loss of control during rapid takeoff rotation by the First Officer."

OBSTRUCTION ON THE RUNWAY

Boeing 727, 26 September 1969, New Orleans, La. During a night takeoff, the aircraft struck and killed a nine-year old mentally retarded child on the runway. There was no aircraft damage.

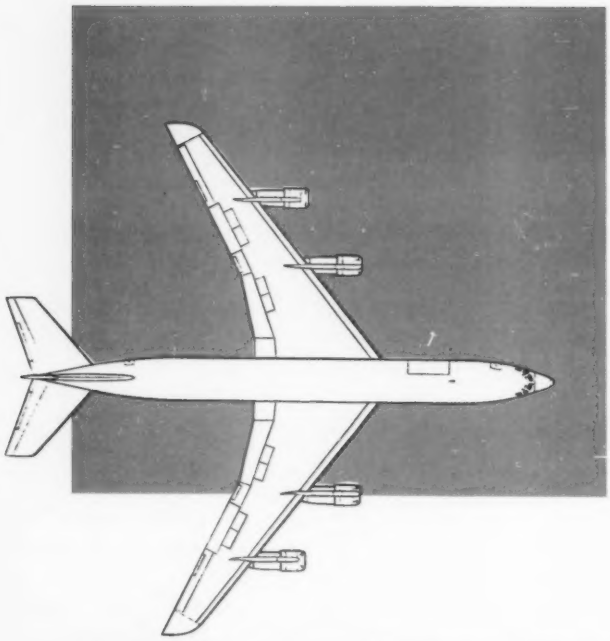
Boeing 707, 30 November 1970, Tel Aviv, Israel. During takeoff the aircraft struck a towed C-97. The Boeing 707 was destroyed; the crew survived. Three persons on the ground were killed.

DC-8, 21 April 1972, San Juan, Puerto Rico. During liftoff, the aircraft struck and killed a man on the runway. No aircraft damage.

DC-9-31, 20 December 1972, Chicago, Ill. The DC-9 was taking off with a valid clearance when it struck a Convair 880 crossing the runway. The collision occurred at night in a prevailing visibility of ¼ mile with fog. The DC-9 was destroyed; ten of its occupants killed. The Convair 880 was substantially damaged. The presence of the Convair 880 on the active runway was attributed to: "an ambiguous transmission from the ground controller; the controller's non-use of all available information to determine the location of the Convair; and the Convair crew's failure to request clarification of the controller's communications."

AIRCRAFT CONFIGURATION

Boeing 707, 26 December 1968, Anchorage, Alaska. The night takeoff from Elmendorf AFB was made with the flaps in the retracted position. The takeoff aural warning system did not function as intended. Shortly after rotation the aircraft began to oscillate laterally and struck the ground in a steep right bank. The crew of three was killed. The only reference to takeoff flaps was on the taxi portion of the cockpit checklist. Initially, the First Officer had lowered the flaps to the takeoff position, but the Captain had



raised them in accordance with company cold weather operating procedures. The Captain advised the First Officer of the flap retraction during a later reading of the taxi checklist. The First Officer's comment "Let's not forget them," was made when the "follow me" truck arrived. While the Captain was concentrating on controlling the aircraft on the slippery taxiways, the First Officer was communicating with Oceanic Control about extending the void time of their clearance. The Flight Engineer was distracted computing how quickly they could climb to FL350. That an intensely occupied crew forgets to extend the flaps in these conditions is understandable. Unfortunately, the takeoff warning system did not alert them to their oversight.

DC-8-54, 11 January 1983, Detroit, Mich. The crew took off with a mistrimmed horizontal stabilizer set at 7.5 units nose up. Compliance with just one of the six distinct procedural requirements would have ensured a trim setting within acceptable limits. After liftoff, the crew was unable to control the pitch-up. The aircraft climbed to about 1,000 feet above field elevation, stalled, and crashed within the airport boundaries. The crew was killed.

DC-9-82, 16 August 1987, Detroit, Mich. After an abnormally long takeoff run, the aircraft lifted off the runway accelerating through 168 KIAS (rotate was 144 KIAS). The stick shaker activated immediately after liftoff and continued to operate until the aircraft struck the ground, 20 seconds later. Only one of the 155 occupants survived; two persons on the ground were also killed. The board determined the crew did not accomplish the taxi checklist in the prescribed manner. As a result, the takeoff was made with the flaps and slats in the retracted position.

ENGINE-RELATED ACCIDENTS

DC-10, 25 May 1979, Chicago, Ill. This was a scheduled passenger flight with 271 persons on board. During rotation the entire Number 1 pylon and engine separated from the aircraft, went over the top of the wing, and fell to the runway. The crew followed the prescribed emergency procedures which called for a climb-out airspeed below the stall speed of the left wing; that wing's outboard slats retracted when hydraulic lines and cables were severed during the engine/pylon separation. The slat disagreement and stall warning system were also disabled. The crew was not in a position to prevent an asymmetrical stall and loss of control. There were no survivors.

DC-9-14, 6 September 1985, Milwaukee, Wis. Takeoff was made in accordance with reduced thrust and standard noise abatement procedures. About 17 seconds after rotation, the aircraft had reached a height of 450 feet AGL and accelerated to 168 KIAS. At this point there was an uncontained failure of the high pressure compressor of the right engine. About 1.5 seconds later, the left engine began to lose power for undetermined reasons. Shortly thereafter, compressor stalls induced blade failures in the left engine as the aircraft descended rapidly in an unusual attitude. Elapsed time between liftoff and impact: 33 seconds. None of the 31 occupants survived.

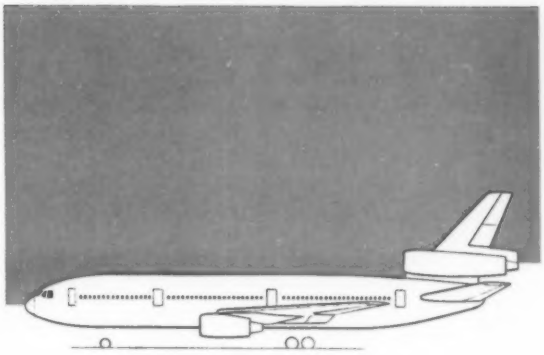
BRAKES/TIRES

DC-8-63, 27 November 1970, Anchorage, Alaska. This was a military contract flight to the Far East, with a crew of 10 and 219 military passengers. The aircraft was 988 pounds below its allowable takeoff weight of 350,000 pounds. The 10,900-foot runway was covered with ice. A light freezing drizzle was falling. The aircraft failed to become airborne during the takeoff run and overran the runway. It struck several obstacles, including a 12-foot deep drainage ditch, and came to a stop 3,400 feet beyond the end of the runway. The impact forces were survivable; 47 persons died in the post-crash fire.

The board determined none of the eight main landing wheels had rotated during the attempted takeoff on the ice-covered runway. (Rotate was 153 KIAS; maximum attained speed was 152 KIAS.) When the tires failed and the aircraft began to slide on the wheel rims, the frictional drag increased.

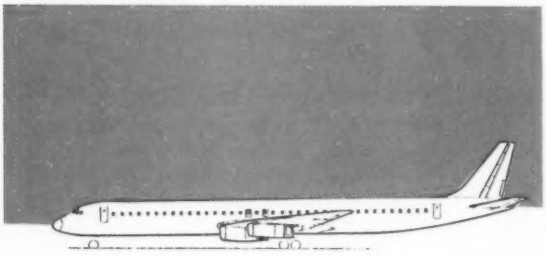
The source of pressure in the brake system which locked all eight wheels was not identified.

DC-10, 1 March 1978, Los Angeles, Calif. This was a scheduled passenger flight bound for Honolulu. Takeoff was rejected just before the aircraft reached V1 speed when the crew heard a loud "metallic bang" and the aircraft began to "quiver." As the aircraft departed the load-bearing surface of the runway, the left main landing gear collapsed and fire erupted in the left wing area. The aircraft slid to a stop about 660 feet from the departure end of the runway. Two of the 200 occupants were killed. During takeoff roll, three of the tires on the left main landing gear failed sequentially. The aircraft could not be stopped on the available runway due to the wet runway surface and the partial loss of braking effectiveness of the failed tires.



JAMMED ELEVATOR

DC-8-63, 8 September 1970, New York, N.Y. After a takeoff roll of only 2,800 feet, the aircraft became airborne and rotated to a nose-high attitude estimated between 60 and 90 degrees. It then began to roll and struck the ground in a nose-down attitude with the wings in a near-vertical position. There were no survivors. The accident was attributed to a "loss of pitch control caused by entrapment of a pointed, asphalt-covered object between the leading edge of the right elevator and the aft part of the stabilizer." The object jamming the elevator was probably a stone.



LOSS OF INSTRUMENTS

Boeing 727, 18 January 1969, Los Angeles, Calif. This scheduled passenger flight was dispatched with an inoperative Number 3 generator. Thirty seconds after takeoff into night instrument conditions, the crew shut down the Number 1 engine for a fire. Shortly thereafter, all generator power was lost and the standby electrical system either was not activated or failed to function. The aircraft crashed out of control into Santa Monica Bay when the crew had no reliable attitude reference inside or outside the cockpit. The 38 occupants were killed.

UNKNOWN CAUSES

Boeing 707-321, 23 July 1973, Tahiti. This was a scheduled passenger flight from Tahiti to Los Angeles. Less than one minute after the night takeoff, the aircraft made the prescribed turn to the left at a lower than normal altitude and struck the surface of the water in near-level flight. Only one of the 79 occupants survived. The board was unable to locate the wreckage and was limited to discussion of various hypotheses including problems with engines, flight controls, instrumentation, visual illusions, and incapacitation.

APPLICATION TO MAC

In the 24-year period from 1966 to 1989, MAC suffered ten class "A" T/O mishaps, of which four were fatal, with a total of 30 occupant deaths.

Since the flight crew is at the receiving end of the system's shortcomings as well as their own, there is a tendency to treat crew preparedness for emergencies as the principal countermeasure. This approach works well when time and information constraints do not cripple the crew's decision-making process.

For example, the pace of operations and reduced power settings during approach and landing seldom deprive a competent crew of the dependable option to make a go-around. However, an emergency during the critical phase of takeoff (near or at V1) demands an almost instantaneous response to information that may be incomplete, misleading, or beyond the crew's analytical capability.

This leads to a sobering conclusion: If as much attention was devoted to prevention of takeoff emergencies as to the crew's response to them, the accident rate could improve considerably.

Adapted From *KAI TALK, FLIGHT SAFETY REVIEW, OCTOBER 1989*

CINCMAC's views on flying and safety

By Lt. Col. Richard L. Buck
Supervising Editor

"Commanders and supervisors are the key to accomplishing the unit mission safely. They set and insist on standards, ensure all their people are properly trained, instill and maintain discipline, and delegate responsibility when needed and appropriate."

These words by General Hansford T. Johnson, who became Military Airlift Command and U.S. Transportation Command's Commander in Chief on Sept. 22, have become his hallmark.

"I've been assigned to several flying commands with different aircraft and missions. I have found common threads in all of them as we look at safety. We make decisions based on knowledge. As the inscription on the Eagle and Fledglings monument at the U. S. Air Force Academy states, "man's flight through life is sustained by the power of his knowledge." Additionally, practice and experience through training, build proficiency. Along with knowledge and training comes situational awareness. This sixth sense tells you it's time to do something before an accident happens. Judgement is that quality which helps a "situationally aware" person do the things right. Finally, discipline, both in the air and on the ground, is the thread that ties it all together. Our instructor crewmembers and flight examiners should be PhDs in knowledge, training, situational awareness, and judgement, and have an extra measure of patience to efficiently impart these qualities in our fledgling aviators."

Referring once again to the role of commanders and supervisors in accomplishing a safe mission, General Johnson said, "When delegating responsibility, they should make sure they also delegate the authority to exercise that responsibility, and should hold their people accountable.

"I have deemphasized 'no notice' checkrides to allow commanders and supervisors (operations officers, chief pilots, chief navigators, chief flight engineers, etc.) to supervise

their people while performing the mission. I also believe flight examiners should fly more as crewmembers to increase their own flying proficiency and to, most importantly, enhance situational awareness and judgement in our younger crew force."

In regard to specific safety goals for MAC, General Johnson sees the human factor element as a major concern. "I want to do everything possible to prevent any Class A or B mishaps due to human factors. Human factor mishaps may include any of a combination of the following: negligence, blatant disregard for rules and procedures, complacency, fatigue, lack of proficiency, or an obsession for mission accomplishment regardless of safety. All of these are avoidable. Supervisors and individual crewmembers are ultimately responsible to avoid mishaps due to human factors. Additionally, I want all our people to develop an appreciation for the 'rationale behind procedures.' Sometimes a procedure needs to be changed. It's far better to identify a need for a change before an accident happens. Too often we discover a procedure is flawed during an accident investigation — then it's too late."

General Johnson also has some definite guidelines on the role of aircrew standardization and the balance between flight safety and the demands placed on MAC crews. "Standards should be **known**. They must be clearly defined, broadly communicated, and clearly understood. They should be achievable through training and measurable in a non-threatening manner. Commanders and supervisors are ultimately responsible for communicating standards and following up on necessary actions when trends develop. In other words, we are all accountable. Safety during peacetime or hostilities is a spinoff of sound procedures, discipline, and proficiency. We cannot justify, under any circumstances, compromising safety in 'the name of accomplishing the mission.' This is contradictory. Accomplishing the mission requires getting the goods where and when they're needed safely, and then returning to accomplish the mission again, again, and again.

"I want to push down responsibility, authority, and accountability. When a person is in command of a crew that's flying, I want that individual to be in total command and be totally responsible. I want every crewmember on the crew, regardless of their seniority, to support the pilot in command. He's the aircraft commander. When I fly, I tell you, you are the aircraft commander and I'll support you any way possible. . . . There's one commander on that airplane and that commander is the aircraft commander. It doesn't mean I don't respect the opinion of you or any other crewmember, but that individual is in charge."

When asked how MAC's mishap prevention efforts measured up when compared with other Air Force Commands, General Johnson said, "When you're dealing with lives and multimillion dollar weapon systems, it's immaterial how we measure up to other commands. Unless a mishap can be clearly attributed to an act of God, it's preventable. Our standard, whether in MAC, SAC, TAC, or ATC, is zero mishaps. Fiscal year 1988 was a pretty good year for MAC, and we should feel good about it. Our statistics for fiscal year 1989 are not good, and all of the Class As are due to human factors. We can do much better! We all have a responsibility to do our jobs right from the very start — doing it right will prevent mishaps."

General Johnson expressed some very valid concerns over the changing role of MAC given the recent developments in Europe and current manpower and budget constraints. He said, "I see MAC's role being enhanced in that airlift is the only way to get things great distances very quickly. Planners would say that we will have enough warning time to mobilize and deploy forces and, in certain instances, they are correct. Historically, warning increases decision time, not movement time. If we do some of the other things we're looking at carefully, we can do some advance preparation but, in the end, airlift is always going to be crucial. We're going to have to work hard to defend some of our initiatives. We're going to have to work hard to defend the C-17 that is so desperately needed."

Motivation has been a key issue in all areas of MAC operations for many years. When asked for his views on factors which motivate MAC crews to fly safely, General Johnson's concern with commander and supervisory involvement and responsibility, came through loud and clear. "The first and most important factor is responsibility. Our professionals feel a great sense of responsibility to their crews, the user, and our Nation to accomplish the mission safely. Most of our crews bring a strong sense of responsibility to their units. But the real potential is realized with the necessary training and leadership that our commanders and supervisors provide on a daily basis. Through leadership,

TMF Supervising Editor Lt Col Richard L. Buck with General Johnson

". . . responsibility, authority, and accountability. . . ."

whether it be the squadron commander or aircraft commander, we motivate our people to strive for proficiency and to learn how to discern the right decisions to make in the face of critical situations. We must all guard against an obsession with mission accomplishment under any circumstances — this blinds our judgement under stressful situations, impairs safety, and jeopardizes the mission.

"Our duty and obligation is to accomplish the mission — safely. Over the years, we have allowed peripheral things to dilute the time and attention our young crew force has needed to gain proficiency and confidence. Therefore, our Air Force leadership deliberately restructured the way we do things to allow the proper focus — the primacy of flight. As our crew force matures, it should reflect confidence in systems and procedural knowledge, and proficiency in performance. The time will come when other things become important and our crews should receive the necessary encouragement and motivation to take those things on and do well in them. This will naturally result in better safety and mission accomplishment. Commanders and supervisors should not place crews in situations for which they are not trained; otherwise, we jeopardize our crews, our valuable weapon systems, our passengers and cargo, and ultimately, the mission. These same commanders and supervisors should never tolerate anyone who displays blatant disregard for the rules and procedures of safety. They should always be alert to the insidious onset of complacency when a unit has reached a high state of readiness and cohesiveness. I want all our people to be confident in the performance of their jobs, but I also want our commanders and supervisors to guard against overconfidence because it can have an unhealthy impact on morale and the mission."

General Johnson's message is clear and concise. Commander and supervisory involvement at all levels must reflect responsibility, authority, and accountability that goes with every job. Everyone is accountable. These elements are essential if MAC is to reach the zero mishap rate goal. General Johnson, we thank you for your comments.

A Landing With Partial Gear

We tend to take landing gear for granted.

On 22 August 1987, a Trans World Airlines (TWA) Boeing 767 landed at Scott AFB, Ill., with the right main landing gear fully retracted. The airplane came to rest in a nose-high, right-wing-low attitude with the right engine supporting the weight of the right wing. The 181 persons aboard evacuated using emergency exits and slides. Three passengers received minor injuries. The airplane sustained minor damage.

FLIGHT HISTORY

The TWA Boeing 767, operating as Flight 756, was a scheduled passenger flight from San Francisco (SFO), Calif., to St. Louis (STL), Mo., and departed SFO on an IFR flight plan at 1047 CDT. The Captain said the flight was normal until approaching STL. The landing gear handle was lowered on approach to Runway 30L, just before reaching the outer marker. The engine-indicating-crew-alerting system (EICAS) displayed "Gear Disagree, Gear Doors," and an aural gear unsafe warning sounded. The instrument panel displayed the following landing gear configuration: nose gear light—green; left main gear light—green; right main gear light—not illuminated; amber door light-illuminated; and amber gear light—illuminated.

The Captain broke off the approach,

departed the traffic pattern, and recycled the landing gear in accordance with the "Gear Disagree" procedure. However, the right main landing gear continued to show an unsafe condition.

When the crew informed TWA's St. Louis maintenance facility of the difficulty, they received instructions to perform the alternate gear extension procedure. Despite the crew's attempts, the right main landing gear remained in an unsafe condition.

The flightcrew then attempted to free the landing gear by inducing positive and negative "G" forces on the airplane. These maneuvers failed. The crew had followed all applicable emergency procedures, but attempts to get the gear down were unsuccesful.

The Captain decided to land at Scott AFB because of a more favorable runway wind component and availability of medical facilities and crash/fire/rescue (CFR) equipment.

Flight attendants were advised to prepare the cabin and passengers for an emergency landing. About 30 seconds before touchdown, the Captain announced they were about to land and passengers were directed to assume the brace for impact position. When the airplane stopped, passengers clapped and cheered as the evacuation alarm sounded; flight attendants opened their assigned emergency doors, ensured that slides were inflated, and started an orderly and rapid evacuation.

All emergency doors opened and slides inflated with exception of the left rear passenger cabin (L-3) door. The flight attendant who was responsible for L-3 door stated that when the evacuation alarm sounded, she grabbed the door handle and pushed it upward. The door opened slightly and stopped. A passenger tried to assist by pushing the door up, but it would not open. The flight attendant then directed passengers to exit using the right rear (R-3) cabin door.

When CFR vehicles arrived at the airplane, many passengers had already exited the aircraft. CFR people took up stations around the airplane in case of fire, but there was none.

ANALYSIS

There was no right main landing gear damage. The airplane received minor right

engine cowl and right wing tip damage. Post-incident examination of the right main landing gear revealed the brake rod had separated from the brake torque arm, had moved in a horizontal plane, and was jammed over the top of the gear door pad in the landing gear wheel well. The bolt used to hold the pin in the brake torque arm was still in place, with a new cotter key installed in the nut. The pin used to hold the brake rod to the brake torque arm was missing and couldn't be found in the wheel well or landing gear doors. The remaining seven pins and bolts in the other wheel/brake assemblies were removed, metallurgically examined, and found serviceable.

An examination of the bottom of the brake rod showed no evidence of scuffing. Brake rod end and brake torque arm bushings were clean, smooth, and not distorted or damaged.

Company records showed that the right main landing gear Number 3 brake and wheel assembly was replaced during a routine maintenance inspection at SFO early on the morning of the incident. Mechanics found an unserviceable brake and tire, requested a work order, and sometime between 0300 and 0500 removed and replaced the Number 3 brake and wheel assembly.

According to Boeing 767 maintenance manuals, the correct procedure for removing the main landing gear wheel/brake assembly requires mechanics to first remove the bolt holding the pin in the brake torque arm. When the pin is pulled out far enough from the brake torque arm, the brake rod is free to move vertically. Mechanics who changed the brake and wheel at SFO stated they removed the bolt and, without the use of a puller, slid the pin out only far enough to free the brake rod from the brake. The free end of the rod was placed on the ground with the pin still retained in the rod.

After the new wheel/brake assembly was installed, the brake rod was aligned with the torque arm on the brake assembly. The retaining bolt was inserted through the hole in the torque arm and through the pin, and the mechanics used a new cotter key to hold the nut on the retaining pin. Company procedures do not require checking removal and replacement of a wheel assembly by a mechanic with inspection authority. In this case, the mechanic who performed the work also signed off completion on the company non-routine maintenance record. Work performed required no documentation in aircraft forms. Therefore, the flightcrew who performed the preflight check for the first flight after the job was not aware the Number 3 brake and wheel of the right main landing gear had been changed.

The two mechanics who performed maintenance were long-time TWA employees. Neither had ever changed a Boeing 767 wheel/brake assembly. Training records showed neither had been instructed on the "differences" between changing the wheel/brake assembly on the B-767 and on other Boeing aircraft. The mechanics didn't set up flood lights to illuminate the work area. They changed the assembly at a terminal gate, using available lighting and flashlights.

The Safety Board believes during installation of the wheel/brake assembly, the mechanics installed the pin through the end of the brake rod, but only partially into the brake torque arm. The bolt used to secure the pin in the torque arm wasn't inserted through the hole in the pin. The Safety Board also believes the brake rod was partially attached to the brake torque arm throughout taxi, takeoff, and gear retraction since the brake stack had not moved in the direction of tire rotation when brake pressure was applied during taxi; hydraulic lines weren't broken; and the bottom of the brake rod wasn't marred or scratched from dragging the ground. When landing gear was retracted, the Number 3 brake rod connector pin would have been head end down. The Safety Board believes during the en route phase of flight, the pin dropped out of the brake torque housing allowing the brake rod to move horizontally until it rested on the landing gear door pad, preventing the landing gear from extending.

PROBABLE CAUSE

The National Transportation Safety Board determined the probable cause of this incident was improper installation of the Number 3 right main landing gear wheel/brake assembly and inadequate inspection of maintenance.

APPLICATION TO MAC

As crewmembers, we often find ourselves preflighting airplanes by the light of the moon on poorly illuminated ramps. These are the same ramps where our maintenance folks have worked to get our aircraft ready to fly. The AFTO Form 781 documents work done, but it's still up those flying the plane to check it out.

Adapted from *NTSB Report AAR-89/02/SUM*

ON HEALTH

WHAT GOES IN, DOESN'T ALWAYS COME OUT!

One of the annual hurdles every flier has to conquer in order to advance in his or her career is the dreaded flight physical. It's easy to tell when someone in the squadron or on the staff is approaching his birth month by the sudden interest shown in healthy diets and meditation techniques. The medical community believes good health practices should be a daily commitment and not just followed prior to an annual physical. Toward that end we at *TMF* would like to provide some basic hints to help you

achieve a successful blood pressure reading. How many of these nutritional, chemical and behavioral blood pressure reducers and raisers should you consider in relation to your own physical inventory?

EXERCISE—Most experts suggest aerobic exercise for 20 to 30 minutes at least three times a week to lower mildly elevated blood pressure.

POTASSIUM—High intake appears to lower high blood pressure slightly. Eat three to four servings of grain products, fresh fruits (especially bananas), and vegetables daily to maintain potassium intake.

CALCIUM—Extra calcium may lower high blood pressure. Eat low-sodium, low-fat milk products to get the recommended daily allowance of calcium (1,000 mg for men; 1,000 to 1,500 for women).

POLYUNSATURATED FAT—(corn, soy, safflower oil). Lowers high blood pressure in some cases. Despite potential benefits, daily intake should be no more than 10 to 12 percent of total calories.

VEGETARIAN DIET—Lowers high blood pressure, perhaps because it is low in sodium and high in potassium, polyunsaturated fat, and fiber.

SODIUM—High intake increases blood pressure. Limit intake to three grams a day by avoiding high-sodium foods and not adding salt during cooking or eating.

STRESS—Effect may vary greatly, but repeated stress appears to raise blood pressure, while relaxation techniques can lower it.

OBESITY—Gaining excess weight, especially between ages 24 and 36, usually raises blood pressure; losing weight at a moderate pace almost always lowers it.

SMOKING—Don't smoke. Smoking briefly increases blood pressure and clearly contributes to heart disease.

ALCOHOL—Limit intake to two ounces a day (equivalent to two 4-oz. glasses or wine, two 8-oz. glasses of beer, or two shots of spirits). Greater amounts can raise blood pressure; withdrawal from alcohol can also raise it.

WHAT HAPPENS TO THE FOOD YOU EAT?

The food we eat comes in three varieties: carbohydrates, protein, and fat. Each is handled differently by the body:

CARBOHYDRATES are converted in the liver to glucose (a simple sugar) and carried to the body tissues where, in the presence of oxygen, they are burned for energy.

PROTEINS consisting of amino acids are used to replace and repair cells within the body.

FAT is broken down into glycerol and fatty acids. They can be used by the body for energy. Most of the time, they're stored in depots located under the skin and around organs.

While this is an oversimplification of the process, it does support the old adage: "You are what you eat . . ." especially if it's fat!

YOU CAN'T TRIM CHOLESTEROL AWAY

Trimming excess fat from a piece of beef does help remove saturated fat but doesn't have much effect on the amount of cholesterol your body is exposed to. Cholesterol is distributed evenly between the fatty tissue and lean muscle tissue in beef, so trimming off excess fat has little effect.

BLOOD FAT

Have you ever seen fat congeal on top of gravy as it cools? Similarly, a test tube of your blood will develop a layer on top if drawn after you've eaten a fatty meal.

WHAT YOUR BODY DOESN'T KNOW

Your body doesn't know whether you're ever going to eat again. As a result, it acts as if every meal is your last. It stores every bit of extra energy a meal provides so it will be available for future use and all this storage is in the form of fat.

Generally there are three types of fat: essential, subcutaneous, and depot. Essential fat is found throughout the body, protecting nerves, cushioning internal organs, and making up membrane cells. Subcutaneous fat lies just beneath the skin surface, and among other things, serves as insulation. Depot fat is excess fat. In women, it usually appears in the thighs and buttocks; in men, in the abdominal area.

Your body stores any excess it receives as depot fat. If your activity level is not high enough to utilize this potential energy source, your "storage bins" will continue to grow. So when you eat, remember, this most likely won't be your last meal, and what goes in doesn't always come out.

Adapted from *Business Aviation Safety, 1989 Journal*

I'm Here to Help, Part 2.

What Do You Call "Reasonable Performance?"

No matter how hard Capt. Brad "Mac" Mackenzie tried, he couldn't stop glancing up at the wall clock. Time was running out for the Safety Investigation Board and it certainly didn't look like there would be unanimous agreement on the cause of the mishap. As it stood, the Board Recorder would be hard pressed to assemble and distribute the formal report by the suspense.

Mac had been on-scene since the start of the investigation—he happened to be conducting a SAV when the mishap occurred. The NAF Commander appointed Mac to be the Commander's representative, so Mac was part of the effort since its start.

The investigation started out very well; the interim board did a good job during the initial response and formal board members had all been on-scene within 36 hours of the mishap, including the investigating officer who came from an overseas location. The "fact finding" segment was accomplished within the 30-day period that every class 'A' mishap works by.

Each board member discovered a definite link in the mishap chain; the dilemma at hand was to decide which of these findings were the cause or causes of the mishap. AFR 127-4 states that causes are "those findings which, singularly or in combination with other causes, resulted in the damage or injury that occurred . . . a deficiency that correction, elimination, or avoidance of which would likely have prevented or mitigated the mishap damage . . . it either starts or sustains the mishap sequence." The regulation further states that "findings which sustain the mishap sequence, but which were normal to the situation as it developed, are not causes."

Mac and the rest of the board had assembled in their designated work area, the old traffic safety classroom, and each had presented their point of view on what they felt was causal. So far, each of the members was reluctant to modify their position. The Board President had called for a ten-minute break and while everyone had slipped out of the room, Mac decided to review the mishap aircraft history of flight once again.

Babe 35, a C-130E, had returned to home station from an overseas mission with minimum ground time at each stop. The flight home was one of the longer legs, with a near maximum crew duty day, coupled with an evening takeoff. This resulted in the crew flying all night, arriving home at midday. At the time of the mishap, the pilot had been awake over 19 hours and on-duty for more than 15. Everyone on the crew had been up at least 18 hours with this last leg transiting five time zones.

"The Effects of Fatigue Are Well Documented."

Weather on the return flight had not been good. The takeoff and departure segments were fine, but shortly after coast out, several route diversions were required to avoid thunderstorms. Eventually, the crew had to change their intended route four times to avoid ominous cells and experienced light to moderate turbulence for over half the trip. Home station weather was acceptable with rain showers and a moderate crosswind.

Both pilots and the flight engineer were relatively inexperienced. The aircraft commander had slightly over 1,300 total flying hours with roughly 1,100 in the C-130. He had only recently upgraded to AC and had less than 100 hours of "pilot in command" time. The copilot was a second lieutenant with 400 total hours and 250 in this aircraft. The flight engineer was the least experienced member of the crew with less than 150 hours of flying time. The remaining crewmembers had significantly more flying hours and everyone on the crew was current and qualified.

About 2 hours out from home station, engine instruments indicated a problem with Number 4 engine. After some unsuccessful troubleshooting, the aircraft commander directed the copilot to shut down the engine and to declare an emergency with ATC. Prior to approach, the pilot checked weather and was told to expect a moderate crosswind and wet runway with showers in the area. The crew then flew an ILS approach with 100 percent flaps. The aircraft experienced 6 to 8 degrees of right drift during the approach and the pilot used a wing low technique for landing.

The aircraft touched down near centerline at a normal distance down the runway. After landing, the aircraft commander retarded power to flight idle and after slowing to 100 KIAS, retarded throttles to ground idle. Shortly thereafter, the inboard engines were put into maximum reverse with the Number 1 throttle remaining at ground idle. As the throttles were retarded to ground idle, the aircraft began a slow drift to the left which increased as the plane continued down the runway. In an attempt to correct left yaw, the pilot transferred control of the yoke to the copilot at a higher than normal speed to apply nosewheel steering. He also used rudder and braking in an attempt to correct the drift.

The aircraft continued to the left and departed the runway on a heading approximately 30 degrees off runway centerline. After departing the prepared surface, the pilot stopped trying to correct back to the runway and concentrated on stopping the aircraft by reversing the Number 1 engine and braking.

Unfortunately, the aircraft could not be stopped before impacting a 12-foot deep and 20-foot wide drainage ditch located slightly over 350 feet from runway centerline. The ditch was a holdover from an earlier runway environment and was allowed by airfield waiver. Upon impact, significant damage occurred, which included destruction of the nose radome and radar, nose landing gear, the Number 1 and 2 propellers and gear boxes, as well as a rupture of the left external tank. There were no significant injuries and everyone safely evacuated the aircraft.

Mac turned his eyes toward the chalkboard at the front of the room and reviewed the proposed findings, one or more of which would have to be labeled causal.

FINDING ONE: A 20-foot wide by 12-foot deep drainage ditch was allowed in the runway environment by waiver.

FINDING TWO: Mission requirements resulted in a flying schedule that was conducive to sleep deprivation fatigue.

FINDING THREE: Number 4 engine was shut down as a result of an internal engine failure.

FINDING FOUR: Weather conditions during the approach included a wet runway and a moderate crosswind, resulting in a maximum of 8 degrees right drift.

FINDING FIVE: The crew flew a 100 percent flap, three engine, ILS approach to a normal touchdown.

FINDING SIX: When the pilot retarded the throttles to ground idle, he failed to input sufficient rudder and the aircraft began to veer left.

FINDING SEVEN: The pilot was unable to regain control of the aircraft.

FINDING EIGHT: The aircraft departed the runway, continued to veer left, and impacted a drainage ditch resulting in major damage.

FINDING NINE: The crew egressed with minor injuries.

Just as Mac decided what he thought the true cause should be, the board members returned and took their places around the conference table. The first to speak was the Board President.

"All right gentlemen, the time has come for us to make a decision. One last time, let's go around the room and each of you tell us what you think. Dr. Radcliff, we'll start with you."

"Sir, my position is the same. I still think we should label Finding Two causal. The effects of fatigue are well documented in medical research and it's reasonable to expect this crew to have increased reaction time, a deterioration in timing, and a tendency to miss cues. A tired pilot is rougher on the controls and will make more errors even on well-learned tasks. If the crew hadn't been as tired as they were, there would not have been a mishap."

"Anyone have comments?"

"Yes Sir, I do." It was Major Larson, the pilot member. "I'm sure what the Doc has said is very true. I can recognize those symptoms in my own flying at the end of one long day, much less three. Still, the fact remains, this crew was well within crew rest guidelines and should not have been extraordinarily tired."

"Does anyone else have any comments on what the Doc has said? If not, we'll give our maintenance troop his turn."

Major Ness looked up from his notes and started to speak. "There is no doubt that the aircraft suffered a mechanical failure. The damage on Number 4 engine was not caused by the crew and there was no way they could have restarted the engine after it had been shut down. I don't think this single engine failure was anything catastrophic and I would have thought the crew should have been able to handle the problem. I'm not sure which finding we should go with. However, I'm very sure that it should not be Finding Three. If I had to label a finding this instant I've got to admit I'm leaning towards Finding One. If that ditch hadn't been there, no real damage would have happened to the aircraft."

"All right Major, thanks for your input, but don't forget we're not limited to just one causal statement. We most certainly will label more than one finding as causal if we see fit to do so. Major Larson, what is your opinion?"

Mac had a good idea what was going to be said next. The pilot member had made his position clear early in the investigation and there was no reason to expect a change.

"I think we should label two of the findings as causal. I agree the ditch should not have been there, and it makes sense to me that its presence started the mishap sequence. I think we have to label Number Seven causal as well. The pilot should have been able to handle the landing. Yes, the runway was wet and he did have a crosswind, and Number 4 was shut down, but we train our pilots to handle this type of emergency. The simulator tests we ran duplicating the mishap scenario show the landing was controllable with correct and timely inputs from the pilot."

The board had reached the center of the controversy. Mac knew some of the board members held strong views on this subject and it didn't surprise him when the investigating officer, Major Kershaw, quickly spoke up.

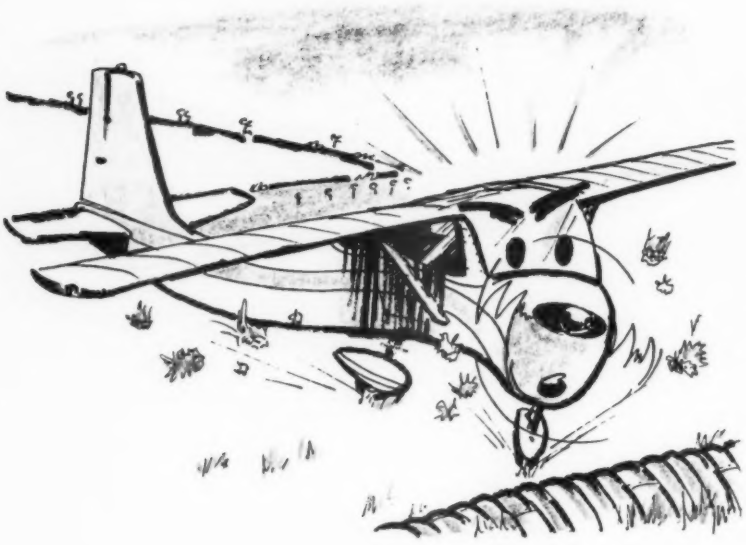
"Let's take a closer look at that concept. When this scenario was run in the simulator with a Flight Examiner Aircraft Commander in the seat, who hadn't been up for 19 hours, the pilot's reactions were good enough to keep the aircraft under control. The technical data from the manufacturer shows that when the propellers are brought into the ground range and the inboards reversed, the asymmetric thrust from Number 1 engine requires corrective rudder within two seconds of the initial movement towards reverse to maintain control. The pilot on the mishap aircraft tried to rely on nose wheel steering as his primary directional input, and it proved to be of no value due to the wet runway and the speeds involved. He made a wrong choice, but did he act reasonably?"

These were the words Mac was waiting to hear. He knew now was the time to make his point. "Sir, I'd like to make sure everyone understands this principle. The regulation clearly states the "reasonable person" concept applies. If a person's performance was reasonable, considering mishap circumstance, we are not to label their actions as causal. Was this pilot's actions, considering the fatigue factor, crew experience, weather considerations, and runway environment, reasonable? Is their no question he should have performed at a higher level? If that's the case, I agree his actions were causal. If not, we have to look elsewhere."

Now, *TMF* reader, it's time for you to make your decision. *You* are the Board President, and whatever you decide will be reflected on the report. Your decision is the majority choice, and, to register your vote, call us at AV 576-3534 before the end of January. The results will be reported in the After Deadlines department of the February issue. Give us a call, we'd like to know your opinion.

QUICKSTOPPERS

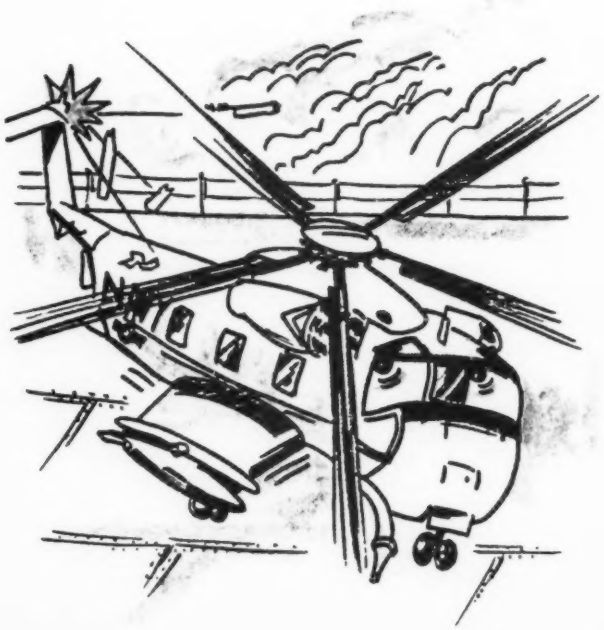
HOW FAST WERE YOU GOING?



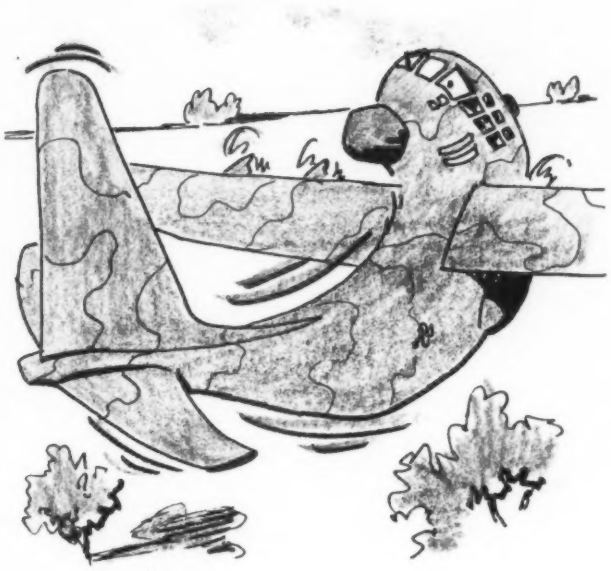
After completing a normal approach and landing, the pilot of an aero club Cessna 152 continued to the end of the runway and attempted to negotiate a 90-degree left turn onto the taxiway. Unfortunately, the pilot failed to slow the aircraft to an appropriate speed and it departed the prepared surface. After passing through a sodded area, the aircraft hit a drainage pipe, sustaining damage to the nosewheel and main wheel fairings. The Cessna's braking system was fully functional, and the pilot stated he simply failed to realize how fast he was going. It appears pilot judgement alone is not always an accurate speedometer.

ANCHORS AWAY!

A Navy helicopter was onloading wooden cargo pallets on the flight deck of a larger-than-life aircraft carrier when a member of the loading team attempted to toss overboard a piece of wood which had broken from a pallet. Instead of departing via the ship's fantail, the wood was drawn into the rotating tail rotor blade where it was reduced to splinters. As the wood was shaped into toothpicks, the rotor blade tip cap assembly also shredded and departed the helicopter for a 50-foot flight of its own. Luckily, no organic matter was intercepted during the tip cap's journey, and damage to government property was limited to mechanical items. I wonder if Charlie Tuna would have considered throwing the wood overboard as proper disposal?



NO DROP!



The C-130 was Number Two in a flight of two, participating in a tactical low-level mission scheduled to airdrop a standard training bundle. Immediately after crossing a ridge line, the flight descended to 500 feet AGL and entered a 30-40 degree right bank. During this maneuver, the airplane encountered an area of convective turbulence described by the pilot as nothing more than a "bump." As the "mean green flying machine" flew through the turbulent area, a loadmaster was attempting to fix a troublesome earpiece in his helmet. When the "bump" was encountered, the loadmaster lost his balance and fell into the center aisle bottom seat support beams which were attached to the right fuselage wall. He tried to break his fall by extending his left arm, an action resulting in the dislodging of one of the beams and the fracturing of his extended appendage. Something that feels like a bump to those seated in the front of the plane may turn out to be a mountain to those standing in the back.

WHAT SMELLS FISHY?

Accumulation of fish fertilizer on the rotor blades of a Hughes 269 helicopter caused an abrupt loss of lift and subsequent destruction of the aircraft. FAA investigators found that the helicopter, used in agriculture application, had a rough coating of dirt and fertilizer on the blades which contributed to a stall as the pilot attempted to climb out of ground effect. There must be some merit to the idea of a "Saturday night bath" for airframes as well as operators.

Courtesy *FAA AVIATION NEWS*

QUICKSTOPPERS

TREE TRIMMING PARTY COULDN'T SEE THE FOREST FOR THE TREES

As the Galaxy taxied to parking on a semitropical island, the IAC in the right seat realized staying on the taxi line wouldn't clear some trees off the right wing tip. A great observation! He directed the first pilot in the left seat to begin a left turn to attain appropriate clearance. Our heros appeared to be heading safely for the chocks, but—not so fast. Our IP checked nose wheel deflection, checked that the tree would no longer be a factor, and told the driver "it's good," (bad choice of words). Our driver then, unbeknownst to the IP, straightened out the nose wheel steering. With the trees looming taller on the ramp edge and rapidly approaching the wing tip, the IAC applied brakes. Too late, the wing tip encountered tree branches and sustained assorted sheet metal damage. So why did history repeat itself? The taxi line followed by the C-5 was adequate for use by C-130s. For a Herk, the trees weren't a factor. When the IP didn't communicate the need to keep turning, the trap was set. Big jets need lots of space to maneuver. Preplan *before* arrival, not *during* taxi to parking.

After Deadlines

MAC COMMAND SAFETY CONFERENCE - The recent conference held at HQ MAC, 13-17 Nov 89, was a resounding success. Your *TMF* staff is hard at work consolidating preconference surveys and post-conference critiques as well as staffing the conference action items. All of which will appear in a special article in an upcoming issue of *TMF* for those of you who couldn't attend.

HYPERBARIC CHAMBER BASE UPDATE - Our article on altitude and hyperbaric chamber bases (those capable of treating decompression sickness) had some flaws in the list. Thanks to observant sources, we've been corrected. It was a test and there were many who passed. Thanks particularly to SMSgt. Cates of Peterson Field for his input. In addition to the four hyperbaric chamber bases listed, the following can also treat decompression sickness:

Beale AFB, Calif.
Peterson Fld, Colo.
Fairfield AFB, Wash.
Ellsworth AFB, S.C. (moving to Offutt in a year)
Edwards AFB, Calif. (within a year)
Kadena AB, Japan
Alconbury RAFB, United Kingdom

SURVIVAL STORIES WANTED - Do you have a survival story you would like to share? The 3636 CCTW/DOV, Fairchild AFB, Wash; 99011-6024, AV 352-2371/2171 is looking for people, who have experienced a survival episode, either military or civilian, that can be used to enchance USAF Survival Training. They will use your valuable experience to let others know what might be expected and how they might feel during a survival episode.

AIRLIFT ASSOCIATION NAMES TOP AIRLIFTERS - The 1989 winners of the association's aircrew awards are Capt. Michael W. Hodge, 55th Special Operations Squadron, Eglin AFB, Fla.; Capt. Jeffrey A. Hoffer, 40th Tactical Airlift Squadron, Pope AFB, N.C.; MSgt. Paul G. Watson, 9th Military Airlift Squadron, Dover AFB, Del.; CMSgt. David H. Frazier, (Air National Guard), 167th Tactical Airlift Group, Martinsburg, W. Va.; and MSgt. Steven W. Hicks, 16th Special Operations Squadron, Hurlburt Field, Fla.

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